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PATENT

Docket No. 96135CON2



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Lucarelli et al.

Group Art Unit: 1711

Serial No.: 09/839,762

Examiner: U.K. Rajguru

Filed: April 20, 2001

For: **POWDER COATING COMPOSITION**

**Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Arlington, VA 22313-1450**

APPELLANTS' BRIEF ON APPEAL

This is an appeal to the Board of Patent Appeals and Interferences from the decision of the Examiner in the Final Office Action dated August 13, 2002 and subsequent Advisory Action dated April 16, 2003 rejecting claims 1-23 of the above-identified patent application. A Notice of Appeal was filed on February 12, 200 and received by the USPTO on February 20, 2003.

I. THE REAL PARTY IN INTEREST

The real party in interest besides the named inventors is Cabot Corporation.

II. RELATED APPEALS AND INTERFERENCES

No other appeal or interference that will directly effect or be effected by or have a bearing on the Board's decision in this appeal is known to the Appellants, the Appellants' legal representative, or the assignee.

III. STATUS OF CLAIMS

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Claims 1-23 are pending in this application and have been finally rejected. All pending claims are on appeal. A copy of the claims on appeal can be found in the attached Appendix A.

IV. STATUS OF AMENDMENTS

Appellant filed a Preliminary Amendment on April 20, 2001. In response to the Office Action mailed November 7, 2001, Appellants then filed an Amendment and Response on May 7, 2002. After receiving the Final Office Action mailed August 13, 2002, Appellants then filed a Response after Final and a Notice of Appeal on February 12, 2003. An Advisory Action was received on April 16, 2003.

V. SUMMARY OF THE INVENTION

The present invention relates to powder coating compositions comprising at least one powdered polymer and a metal oxide which has been sized-reduced to a specified mean agglomerate particle size.

VI. ISSUES

The only issue on appeal is whether claims 1-23 are patentable under 35 U.S.C. § 103(a) over GB 2311527 in view of GB 2296915.

VII. GROUPING OF CLAIMS

As presently appealed, the grouping of the claims are as follows:

- Claims 1-11 stand or fall together;
- Claims 12-13 stand or fall together;
- Claims 14-22 stand or fall together; and
- Claim 23 stands or falls alone.

VIII. ARGUMENTS

The Examiner has rejected claims 1-23 under 35 U.S.C. § 103(a) as being unpatentable over GB 2311527 (GB '527) in view of GB 2296915 (GB '915).

In paragraph 5 of the Final Office Action, the Examiner incorporates item 6 from the previous Office Action by reference, in which the Examiner characterizes GB '527 as disclosing powder coating compositions comprising particles of thermosetting resin and 0.05 to 2.0 parts by weight, per 100 parts by weight of said resin, of finely divided hydrophobic silica powder having a number average particle size of 3 to 10 nm.

The Appellants, in their reply filed May 7, 2002, presented arguments and objective evidence to show that the particle size disclosed in GB '527 is the primary particle size of the silica powder and not the agglomerate particle size, as in the present invention, and that these sizes are independent properties. However, in considering these arguments, the Examiner reiterated the statement that GB '527 teaches silica powder having a particle size of 3-10 nanometers and further concluded that, "...even if the particle size of GB '527 is the primary particle size and the primary particles adhere to one another to make aggregates which combine to form agglomerates, it would be reasonable to infer that the agglomerates formed from the primary particles of GB '527 (of 10 nanometers each) can be less than 25000 nanometers."

The Appellants then filed a Response After Final Rejection, presenting further arguments and objective evidence that the Examiner's statements were incorrect. However, in an Advisory Action mailed April 16, 2003, the Examiner merely stated the opinion that the claimed limitation (agglomerate particle size) fails to patentably distinguish over the prior art which recites the same physical property as "number average particle size."

Rejection of Claims 1-11

Claim 1 discloses a powder coating composition comprising at least one powdered polymer and a metal oxide, wherein the metal oxide has been size-reduced to a mean agglomerate particle size of less than about 25 microns.

GB '527 does not teach or suggest a metal oxide with an agglomerate particle size of less than about 25 microns. The finely divided hydrophobic silica powder used in GB '527 are

disclosed as having a number average primary particle size from 3 to 10 nm. These are not the metal oxides used in the powder polymer compositions of claim 1 of the present invention. Specifically, there is no disclosure of the agglomerate particle size of the hydrophobic silica powder of GB '527. Furthermore, the Examiner has provided no evidence to support the conclusion that the hydrophobic silicas of GB '527 have been sized reduced to a mean agglomerate particle size of 25 microns or less. Rather, the Examiner has inferred that a primary particle size of 7 nm would necessarily mean that the agglomerate particle size would have to be less than 25000 nm (i.e., 25 microns).

In fact, this is contrary to what one of ordinary skill in the art would expect. *It is known that primary particle size and agglomerate particle size are independent morphological properties and cannot be correlated with each other.* Metal oxides are formed by the aggregation of primary particles which, in turn, form agglomerates. The size of the primary particles are typically in the 10 nm range while the aggregate particle size is quite often 100-250 nm. However, agglomerates of these aggregates are several orders of magnitude larger – generally in the 50-100 micron range or larger. For example, section 3.2 of the Technical Bulletin No. 11 entitled “Basic Characteristics of AEROSIL®” from Degussa, enclosed with this Appeal Brief, clearly shows that AEROSIL products (such as those preferred in GB '527) contain agglomerates of about 10 to 200 microns (see page 22, as well as the micrographs shown in section 3.2.1 on pages 24-25). The mean agglomerate particle size of a metal oxide depends on a wide variety of factors, including, for example, type of metal oxide, surface chemistry (hydrophobic versus hydrophilic), and processing conditions, and cannot be predicted from its primary particle size. Therefore, one of ordinary skill in the art would not conclude that the hydrophobic silica of GB '527 would necessarily have a mean agglomerate particle size of 25 microns or less, knowing only that the primary particle size was 7 nm.

Since the mean agglomerate particle size of the hydrophobic silica of GB '527 is not disclosed, and since hydrophobic silicas agglomerate to form very large particles with mean agglomerate particle sizes that cannot be predicted from their primary particle sizes, one skilled in the art would not have inferred that the hydrophobic silica of GB '527 would have a mean

agglomerate particle size less than 25 microns. Furthermore, GB '527 does not teach or suggest that the hydrophobic silica has been sized-reduced, and, certainly, not size-reduced to the mean agglomerate particle sizes disclosed in the present invention. Thus, Appellants believe that GB '527 does not teach or suggest the powder polymer compositions of claim 1.

GB '915 does not cure the deficiencies of GB '527. GB '915 discloses surface-modified pyrogenically produced metal oxides. However, there is no teaching or suggestion in GB '915 of a metal oxide having a mean agglomerate particle size of less than about 25 microns. In addition, GB '915 does not teach or suggest a metal oxide that has been size-reduced. Therefore, Appellants believe that GB '915 does not teach or suggest the powder coating compositions of claim 1.

Finally, Appellants believe that, since neither GB '527 nor GB '915 teach or suggest a powder coating composition comprising a metal oxide that has been size-reduced to a mean agglomerate particle size disclosed in the present invention, the combination of these two references cannot produce the powder coating composition of claim 1. If one were to combine the teachings of GB '527 and GB '915, one would attempt to use the surface-modified pyrogenically produced metal oxides of GB '915 in the compositions of GB '527. However, as discussed in more detail above, this is not the powder coating composition of the present invention.

Thus, Appellants believe that claim 1 of the present application is patentable over GB '527 in view of GB '915. Furthermore, claims 2-11, which directly or indirectly depend from claim 1, relate to further embodiments of the present invention and, for at least the reasons discussed above, are also believed to be patentable over the cited references. Appellants therefore respectfully request that the rejection of claims 1-11 be reversed.

Rejection of Claims 12-13

Claim 12 discloses a powder coating composition comprising from about 99.5 to about 99.9 wt% at least one powdered polymer and from about 0.1 to about 0.5 wt% of the reaction

product of fumed silica and hexamethyldisilazane, wherein the reaction product has been size-reduced to a mean agglomerate particle size of less than 10 microns.

As discussed in more detail above, the finely divided hydrophobic silica powder used in GB '527 are disclosed as having a number average primary particle size from 3 to 10 nm. The mean agglomerate particle size of the hydrophobic silica of GB '527 is not disclosed. Since hydrophobic silicas agglomerate to form very large particles with mean agglomerate particle sizes that cannot be predicted from their primary particle sizes, one skilled in the art would not have inferred that the hydrophobic silica of GB '527 would have a mean agglomerate particle size less than 10 microns. Furthermore, GB '527 does not teach or suggest that the hydrophobic silica is the reaction product of silica and hexamethyldisilazane which has been sized-reduced, and, certainly, not size-reduced to the mean agglomerate particle sizes disclosed in claim 12.

Also as discussed above, GB '915 does not cure the deficiencies of GB '527. Furthermore, the combination of these two references would not produce the powder coating composition of claim 12.

Thus, Appellants believe that claim 12 of the present application is patentable over GB '527 in view of GB '915. Furthermore, claim 13, which directly depends from claim 12, relates to a further embodiment of the present invention and, for at least the reasons discussed above, is also believed to be patentable over the cited references. Appellants therefore respectfully request that the rejection of claims 12-13 be reversed.

Rejection of Claims 14-22

Claim 14 discloses a powder coating composition comprising at least one powdered polymer and the non-deammoniated reaction product of at least one metal oxide and hexamethyldisilazane, wherein the reaction product has been size-reduced to a mean agglomerate particle size of less than about 25 microns.

As discussed in more detail above, the finely divided hydrophobic silica powder used in GB '527 are disclosed as having a number average primary particle size from 3 to 10 nm. The mean agglomerate particle size of the hydrophobic silica of GB '527 is not disclosed. Primary

particle size and agglomerate particle size are independent morphological properties that cannot be correlated to each other. Thus, one skilled in the art would not have inferred that the hydrophobic silica of GB '527 would have a mean agglomerate particle size less than 25 microns. Furthermore, GB '527 does not teach or suggest that the hydrophobic silica is the non-deammoniated reaction product of at least one metal oxide and hexamethyldisilazane which has been sized-reduced, and, certainly, not size-reduced to the mean agglomerate particle sizes disclosed in claim 14.

Also as discussed above, GB '915 does not cure the deficiencies of GB '527. Furthermore, the combination of these two references would not produce the powder coating composition of claim 14.

Thus, Appellants believe that claim 14 of the present application is patentable over GB '527 in view of GB '915. Furthermore, claims 15-22, which directly or indirectly depend from claim 14, relate to further embodiments of the present invention and, for at least the reasons discussed above, are also believed to be patentable over the cited references. Appellants therefore respectfully request that the rejection of claims 14-22 be reversed.

Rejection of Claim 23

Claim 23 discloses a powder coating composition comprising from about 98 to about 99.9 weight percent of at least one powdered polymer and from about 0.1 to about 2.0 weight percent of a flatting agent that is the non-deammoniated reaction product of from about 80.0 to about 99.9 weight percent fumed silica and about 0.1 to about 20.0 weight percent hexamethyldisilazane, wherein the reaction product has been size-reduced to a mean agglomerate particle size of less than about 25 microns.

As discussed in more detail above, the finely divided hydrophobic silica powder used in GB '527 are disclosed as having a number average primary particle size from 3 to 10 nm. The mean agglomerate particle size of the hydrophobic silica of GB '527 is not disclosed. Primary particle size and agglomerate particle size are independent morphological properties that cannot be correlated to each other. Thus, one skilled in the art would not have inferred that the

hydrophobic silica of GB '527 would have a mean agglomerate particle size less than 25 microns. Furthermore, GB '527 does not teach or suggest that the hydrophobic silica is a flatting agent that is the non-deammoniated reaction product of at least one metal oxide and hexamethyldisilazane which has been sized-reduced, and, certainly, not size-reduced to the mean agglomerate particle sizes disclosed in claim 23. GB '527 also does not teach or suggest that the hydrophobic silica is the non-deammoniated reaction product of the amounts of metal oxide and hexamethyldisilazane disclosed.


Also as discussed above, GB '915 does not cure the deficiencies of GB '527. Furthermore, the combination of these two references would not produce the powder coating composition of claim 14.

Thus, Appellants believe that claim 23 of the present application is patentable over GB '527 in view of GB '915 and respectfully request that the rejection of this claim be reversed.

IX. CONCLUSION

For the reasons discussed above, Appellants believe that the Examiner's rejections of the claims of the present application should be reversed and this application should be allowed to pass to issuance as soon as possible.

Respectfully submitted,

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